



**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

**Permit Application Analysis
A0000713**

July 31, 2015

NAME OF FIRM:	TRONOX Alkali Wyoming Corporation
NAME OF FACILITY:	Westvaco Facility
FACILITY LOCATION:	Sections 14, 15, 22, and 23 of T19N, R110W Sweetwater County, Wyoming
TYPE OF OPERATION:	Soda Ash Production
RESPONSIBLE OFFICIAL:	John Lucas, Environmental Team Leader
MAILING ADDRESS:	P.O. Box 872 Green River, WY 82935
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REVIEWERS:	Andrew Keyfauver, NSR Permit Engineer Nathan Henschel, NSR Air Quality Modeler

1.0 PURPOSE OF APPLICATION

TRONOX Alkali Wyoming Corporation (TRONOX) submitted an application to modify operations at the Westvaco Facility with various projects at its plants to increase production. The projects are listed below:

ELDM Plant

- Installation of heat-exchanger equipment for preheating mine water feeding the stripper/evaporators
- Replacement and upgrade of the mine water stripper column packing
- Piping installation to facilitate condensate diversion around the flash tanks
- Replacement of the fluid bed dryer feed screws with higher capacity units
- Utilize excess capacity of the decahydrate section of the ELDM plant to purify and concentrate the monohydrate stream from the Granger Facility. A concentrated stream would then be sent back to the Granger Facility's Mono Crystallizers. This modification will include the installation of pipelines between Westvaco and Granger.

Monohydrate Plant

- Replacement of filter piping
- Provision for de-superheating 25 lb. steam to the process
- Replacement of Mono2 circulating pumps
- Heat exchanger replacement (HE-3501)
- Application of variable frequency drive technology to the Mono1 slurry pumps

Sesqui Plant

- Upgrade of ore dissolver feed bin sensors
- Installation of additional piping from the ore dissolvers to the clarifiers
- Improvements to the flocculent addition system
- Modification of the scale inhibitor system including installation of a scale inhibitor system after the dissolvers
- Enhancement of filter performance
- Capacity increase for a wash-water tank

Caustic Plant

- Installation of a spare pump and line for the lime slaker
- Caustic filter optimization

Utilities

- Re-start the fly ash loadout system
- Recondition or replace both of the ash handling baghouses

2.0 PERMIT HISTORY

On August 11, 2014, TRONOX was issued permit waiver wv-16624. This waiver authorized the rebasketing of the air heater in Boiler 7 (NS-1B).

On July 25, 2014, TRONOX was issued permit waiver wv-16570. This waiver authorized the replacement of the steam coil replacement on the MW-3 ELDM Fluid Bed Dryer.

On December 20, 2012, TRONOX was issued permit waiver wv-14197. This waiver authorized the replacement of one (1) 255 hp Cummins NT-855-F1 emergency engine with one (1) 350 hp Cummins CFP9E-F50 fire pump engine.

On November 1, 2011, TRONOX was issued permit waiver wv-12651. This waiver authorized the installation of two (2) 3 MMBtu/hr natural gas fired heaters in the milled trona facility.

On June 17, 2011, TRONOX was issued permit waiver wv-11992. This waiver authorized three (3) existing emergency generators: one (1) 890 hp diesel-fired Caterpillar 3412 CDITA emergency engine (SN: 81Z10060), one (1) 575 hp diesel-fired Caterpillar 3412 DIT emergency engine (SN: 38S15400), and one (1) 255 hp diesel-fired Cummins NT-855-F1 emergency engine (SN: 10598480).

On May 9, 2011, TRONOX was issued modification permit MD-11764. This permit authorized the addition of a Beneficiated Milled Trona (BMT) plant that will produce up to 500,000 tons per year of milled trona.

On March 31, 2011, TRONOX was issued permit waiver wv-11821. This waiver modified the ELDM MW-6 Mine Water Stripper Vent Scrubber to capture H₂S emissions by installing piping to connect the mono evaporator vent streams to the MW-6 scrubber.

On February 1, 2011, TRONOX was issued permit waiver wv-11612. This waiver increased the production rate of sodium bicarbonate. This project involves: (1) an upgrade of the Sesqui slurry supply system, which provides feedstock for the Bicarb facility; and (2) additional filters in the Bicarb facility to add filter volume and to reduce backwash frequency.

On August 4, 2010, TRONOX was issued permit waiver wv-10899. This waiver removed the NO_x emission limits for a 2,814 hp 1998 Cummins Wartsila CW170 emergency generator powered by a Cummins QSW73-G diesel engine. This waiver superseded permit waiver wv-6292.

On April 9, 2010, TRONOX was issued permit waiver wv-10492. This waiver authorized the replacement of the Mono 1 Fluid Bed Dryer (MONO-6) steam coils.

On July 17, 2009, TRONOX was issued modification permit MD-6045. This permit is a Best Available Retrofit Technology (BART) permit for boilers NS-1A and NS-1B, to include operation of low NO_x burners and enhanced overfire air for NO_x control and dry ESP for PM control on each boiler.

On June 29, 2009, TRONOX was issued permit waiver wv-9439. This waiver authorized the installation of one (1) 83 hp GM 4.3L V6 engine to pump methane from boreholes drilled to help ventilate areas actively being mined by the longwall. On August 3, 2009, this waiver was corrected to revise the NSCR catalyst to thermal catalyst and corrected total HAPs for the facility.

On June 17, 2009, TRONOX was issued permit waiver wv-9393. This waiver authorized the rebasketing of the Ljungstrom Air Preheater for boiler NS-1A.

On April 16, 2009, TRONOX was issued permit waiver wv-9043. This waiver authorized steam tube replacement in boiler NS-1B. On June 4, 2009, this waiver was corrected to modify the actual emission calculation methodologies contained in the appendix.

On October 24, 2007, TRONOX was issued Operating Permit 3-1-132 for the Westvaco Facility. This permit authorized the operation of the Westvaco Facility as a major source of emissions as defined under Chapter 6, Section 3 of the WAQSR.

3.0 ESTIMATED EMISSIONS

The only potential emissions increase from the Westvaco Facility will be from the recommissioning of the fly ash handling system which will be controlled with baghouses. Table 3-1 shows an overall view of the emissions from this facility, and these emissions were taken from permit waiver wv-16624. Table 3-2 shows the potential emissions for the fly ash handling baghouses.

Table 3-1: Facility Potential Emissions (tpy)						
	NO _x	PM/PM ₁₀	CO	VOC	SO ₂	HAP
Existing Emissions ¹	4533.2	1870.0	2950.7	331.5	4198.8	117.7

¹ Emissions taken from permit waiver wv-16624.

Table 3-2: Fly Ash Handling Baghouse Potential-to-Emit (tpy)						
Emission Unit	Source ID	scfm	Pollutant	gr/dscf	lb/hr	tpy
Mono Power Fly Ash Silo	NS-10	1600	PM ₁₀	0.005	0.1	0.3
			PM _{2.5}	---	<0.1	0.1
Mono Power Fly Ash Loadout	NS-11	1600	PM ₁₀	0.005	0.1	0.3
			PM _{2.5}	---	<0.1	0.1

4.0 CHAPTER 6, SECTION 4 – PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The Westvaco Facility is a major stationary source under Chapter 6, Section 4 of the Wyoming Air Quality Standards and Regulations (WAQSR), as the facility is a named source (fossil-fuel boilers or combination thereof of more than two hundred and fifty million Btu/hour heat input) which emits or has the potential to emit one hundred tons per year or more.

Under Chapter 6, Section 4 of the WAQSR there are two methodologies for determining if a significant emission increase occurs for a project. This determination consists of either an actual-to-potential emissions test or a baseline actual-to-projected actual emissions test. For this project, TRONOX has utilized baseline actual-to-projected actual emissions for determining if a significant increase will occur as a result of the project.

4.1 Project Affected Emission Units

In using the baseline actual-to-projected actual test, TRONOX is required to determine the emissions units which are affected by the project. TRONOX evaluated all emission units at the Westvaco Facility to define potential project impacts on production rates and emissions. Based on an evaluation of the emission units at the Westvaco Facility, TRONOX determined that the units shown in Table 4-1 are the project affected emission units due to a physical change, a change in the method of operation, or increased utilization.

Table 4-1: Project Affected Emission Units			
Source ID	Source Description	Source ID	Source Description
PA-4	Sesqui Hammermill Crusher Vent	MONO10	Mono Bulk Truck Loadout
PA-5	Sesqui Plant Ore Screening Vent	MONO12	Mono Loadout Screening
PA-6	Sesqui Plant Dissolver Vent	NS6	Mono 2 Fluid Bed Dryer
PA-7	Sesqui Plant Dissolver Vent	MONO1CT	Mono 1 Cooling Tower
PA-8	Sesqui Plant Dissolver Vent	MONO2CT	Mono 2 Cooling Tower
PA-9	Sesqui Plant Dissolver Vent	MW1	ELDM Lime Silo
RA-1	R-3 Gas-Fired Calciner	MW2	ELDM Perlite Precoat Silo
RA-22A&B	R-9 Gas-Fired Calciner	MW3	ELDM Fluid Bed Dryer
RA-23A&B	R-13 Gas-Fired Calciner	MW4	Mine Water Housekeeping
RA-24	R-15 Gas-Fired Calciner	MW6	H ₂ S Scrubber/CO ₂ Stripping System
RA-25	R-5 Sesqui Fluid Bed Calciner	MW7	LWP H ₂ S Vent
RA-26	R-6 Sesqui Fluid Bed Calciner	RD3	Lime Slaker Silo
RA-29	R-2 Sesqui Fluid Bed Calciner	SM1	Lime Kiln

Table 4-1: Project Affected Emission Units			
Source ID	Source Description	Source ID	Source Description
RA-28	Sesqui Bagging	PH-1A	#1 Gas-Fired Boiler
RA-33	Sesqui Silo Storage	PH-1B	#2 Gas-Fired Boiler
SESQUIPILE	Sesqui Ore Stockpile Activity	PH-2	#3 Gas-Fired Boiler
SESQWE	Sesquie Ore Stockpile Wind Erosion	PH-3	#4 Gas-Fired Boiler
SESQUILOAD	Sesquie Plant Railcar Loading	MW-5	#8 Gas-Fired Boiler
SESQUI-CT	Sesqui Cooling Tower	Rail	Switch Engine Activity
MONO6	Mono 1 Fluid Bed Dryer	NS-10	Mono Power Fly Ash Silo
MONO9	Mono Railcar Loadout	NS-11	Mono Power Fly Ash Truck Loading

4.2 Baseline Actual Emissions

Baseline actual emissions are emissions from any consecutive 24-month period within a 10-year period preceding the project for a non-electric utility steam generating unit. TRONOX chose years 2013 and 2014 for establishing their baseline actual emissions for the project affected emission units. Emissions from these years were based on historical production records and the best available emissions data. This data consisted of continuous emission monitoring systems (if available), stack test data (if available), AP-42 emission factors, and engineering estimates. Table 4-2 shows the baseline actual emissions for the project affected emission units at the Westvaco Facility.

Table 4-2: Baseline Actual Emissions (tpy) [Average of 2013-2014]								
Source ID	Source Description	PM	PM ₁₀	PM _{2.5}	NO _x	CO	VOC	H ₂ S
PA-4	Sesqui Hammermill Crusher Vent	2.9	2.9	2.6	--	--	--	--
PA-5	Sesqui Plant Ore Screening Vent	2.9	2.9	2.4	--	--	--	--
PA-6	Sesqui Plant Dissolver Vent	1.8	1.8	1.8	--	--	--	--
PA-7	Sesqui Plant Dissolver Vent	1.9	1.9	1.9	--	--	--	--
PA-8	Sesqui Plant Dissolver Vent	1.9	1.9	1.9	--	--	--	--
PA-9	Sesqui Plant Dissolver Vent	1.9	1.9	1.9	--	--	--	--
RA-1	R-3 Gas-Fired Calciner	5.6	5.6	2.2	7.9	0.6	0.1	--
RA-22A&B	R-9 Gas-Fired Calciner	0.1	0.1	0.0	--	--	--	--
RA-23A&B	R-13 Gas-Fired Calciner	10.0	10.0	5.9	5.5	7.4	0.6	--
RA-24	R-15 Gas-Fired Calciner	21.0	21.0	9.9	26.2	11.4	0.7	--
RA-25	R-5 Sesqui Fluid Bed Calciner	13.3	13.3	6.5	--	--	0.4	--
RA-26	R-6 Sesqui Fluid Bed Calciner	9.6	9.6	5.5	--	--	0.5	--
RA-29	R-2 Sesqui Fluid Bed Calciner	5.7	5.7	3.5	--	--	0.2	--
RA-28	Sesqui Bagging	3.5	3.5	1.4	--	--	--	--
RA-33	Sesqui Silo Storage	7.2	7.2	1.1	--	--	--	--
SESQUIPILE	Sesqui Ore Stockpile Activity	10.1	3.4	0.4	2.1	0.6	0.2	--
SESQWE	Sesquie Ore Stockpile Wind Erosion	0.1	0.1	0.0	--	--	--	--
SESQUILOAD	Sesquie Plant Railcar Loading	0.5	0.5	0.2	--	--	--	--
SESQUI-CT	Sesqui Cooling Tower	2.5	2.5	0.0	--	--	--	--
MONO6	Mono 1 Fluid Bed Dryer	11.9	11.9	7.1	--	--	0.2	--
MONO9	Mono Railcar Loadout	4.0	4.0	1.6	--	--	--	--
MONO10	Mono Bulk Truck Loadout	7.2	7.2	2.9	--	--	--	--
MONO12	Mono Loadout Screening	6.3	6.3	3.1	--	--	--	--
NS6	Mono 2 Fluid Bed Dryer	13.6	13.6	7.4	--	--	0.4	--
MONO1CT	Mono 1 Cooling Tower	2.8	2.8	0.0	--	--	--	--
MONO2CT	Mono 2 Cooling Tower	3.1	3.1	0.0	--	--	--	--

Table 4-2: Baseline Actual Emissions (tpy) [Average of 2013-2014]								
Source ID	Source Description	PM	PM ₁₀	PM _{2.5}	NO _x	CO	VOC	H ₂ S
MW1	ELDM Lime Silo	0.8	0.8	0.3	--	--	--	--
MW2	ELDM Perlite Precoat Silo	0.0	0	0.0	--	--	--	--
MW3	ELDM Fluid Bed Dryer	24.5	24.5	15.5	--	--	0.3	--
MW4	Mine Water Housekeeping	2.6	2.6	1.0	--	--	--	--
MW6	H ₂ S Scrubber/CO ₂ Stripping System	--	--	--	--	--	--	3.0
MW7	LWP H ₂ S Vent	--	--	--	--	--	--	0.0
RD3	Lime Slaker Silo	0.2	0.2	0.2	--	--	--	--
SM1	Lime Kiln	18.8	18.8	9.2	80.5	1.7	1.4	--
PH-1A	#1 Gas-Fired Boiler	0.5	0.5	0.5	15.3	5.4	0.4	--
PH-1B	#2 Gas-Fired Boiler	0.5	0.5	0.5	15.8	5.5	0.4	--
PH-2	#3 Gas-Fired Boiler	0.4	0.4	0.4	10.6	3.7	0.3	--
PH-3	#4 Gas-Fired Boiler	0.9	0.9	0.9	22.1	9.7	0.6	--
MW-5	#8 Gas-Fired Boiler	2.1	2.1	2.1	5.2	12.1	1.5	--
Rail	Switch Engine Activity	1.2	1.2	1.2	48.0	5.4	3.0	--
Baseline Actual Emissions Total		203.4	209.6	102.4	238.9	63.0	10.9	3.0

4.3 Projected Actual Emissions

Projected actual emissions for the project were estimated based on highest historical operation data and future business projections. Table 4-3 shows the projected actual emissions from the project affected emission units at the Westvaco Facility.

Table 4-3: Projected Actual Emissions (tpy)								
Source ID	Source Description	PM	PM ₁₀	PM _{2.5}	NO _x	CO	VOC	H ₂ S
PA-4	Sesqui Hammermill Crusher Vent	3.4	3.4	2.9	--	--	--	--
PA-5	Sesqui Plant Ore Screening Vent	3.2	3.2	2.7	--	--	--	--
PA-6	Sesqui Plant Dissolver Vent	2.0	2.0	2.0	--	--	--	--
PA-7	Sesqui Plant Dissolver Vent	2.2	2.2	2.2	--	--	--	--
PA-8	Sesqui Plant Dissolver Vent	2.1	2.1	2.1	--	--	--	--
PA-9	Sesqui Plant Dissolver Vent	2.1	2.1	2.1	--	--	--	--
RA-1	R-3 Gas-Fired Calciner	6.3	6.3	2.5	9.0	0.6	0.1	--
RA-22A&B	R-9 Gas-Fired Calciner	0.1	0.1	0.0	--	--	--	--
RA-23A&B	R-13 Gas-Fired Calciner	11.4	11.4	6.7	6.3	8.5	0.7	--
RA-24	R-15 Gas-Fired Calciner	23.9	23.9	11.3	29.0	13.0	0.8	--
RA-25	R-5 Sesqui Fluid Bed Calciner	15.2	15.2	7.4	--	--	0.5	--
RA-26	R-6 Sesqui Fluid Bed Calciner	10.9	10.9	6.3	--	--	0.6	--
RA-29	R-2 Sesqui Fluid Bed Calciner	6.5	6.5	3.9	--	--	0.2	--
RA-28	Sesqui Bagging	4.0	4.0	1.5	--	--	--	--
RA-33	Sesqui Silo Storage	8.2	8.2	1.6	--	--	--	--
SESQUIPILE	Sesqui Ore Stockpile Activity	11.5	3.7	0.5	2.4	0.7	0.2	--
SESQWE	Sesquie Ore Stockpile Wind Erosion	0.1	0.1	0.0	--	--	--	--
SESQUILOAD	Sesquie Plant Railcar Loading	0.6	0.6	0.2	--	--	--	--
SESQUI-CT	Sesqui Cooling Tower	3.0	3.0	0.0	--	--	--	--
MONO6	Mono 1 Fluid Bed Dryer	13.3	13.3	7.9	--	--	0.2	--
MONO9	Mono Railcar Loadout	4.6	4.6	1.8	--	--	--	--
MONO10	Mono Bulk Truck Loadout	8.3	8.3	3.3	--	--	--	--
MONO12	Mono Loadout Screening	7.2	7.2	3.5	--	--	--	--

Table 4-3: Projected Actual Emissions (tpy)								
Source ID	Source Description	PM	PM ₁₀	PM _{2.5}	NO _x	CO	VOC	H ₂ S
NS6	Mono 2 Fluid Bed Dryer	15.2	15.2	8.3	--	--	0.4	--
MONO1CT	Mono 1 Cooling Tower	3.2	3.2	0.0	--	--	--	--
MONO2CT	Mono 2 Cooling Tower	3.7	3.7	0.0	--	--	--	--
MW1	ELDM Lime Silo	1.0	1.0	0.4	--	--	--	--
MW2	ELDM Perlite Precoat Silo	0.0	0.0	0.0	--	--	--	--
MW3	ELDM Fluid Bed Dryer	29.9	29.9	18.4	--	--	0.3	--
MW4	Mine Water Housekeeping	3.1	3.1	1.2	--	--	--	--
MW6	H ₂ S Scrubber/CO ₂ Stripping System	--	--	--	--	--	--	3.6
MW7	LWP H ₂ S Vent	--	--	--	--	--	--	0
RD3	Lime Slaker Silo	0.2	0.2	0.2	--	--	--	--
SM1	Lime Kiln	19.5	19.5	9.5	83.5	1.7	1.0	--
PH-1A	#1 Gas-Fired Boiler	0.7	0.7	0.7	22.7	8.0	0.5	--
PH-1B	#2 Gas-Fired Boiler	0.8	0.8	0.8	23.4	8.2	0.5	--
PH-2	#3 Gas-Fired Boiler	0.5	0.5	0.5	15.7	5.5	0.4	--
PH-3	#4 Gas-Fired Boiler	1.3	1.3	1.3	32.4	14.4	0.9	--
MW-5	#8 Gas-Fired Boiler	3.1	3.1	3.1	12.2	18.0	2.2	--
Rail	Switch Engine Activity	1.4	1.4	1.4	55.0	6.1	3.4	--
NS-10	Mono Power Fly Ash Silo	0.3	0.3	0.1	--	--	--	--
NS-11	Mono Power Fly Ash Truck Loading	0.3	0.3	0.1	--	--	--	--
Projected Actual Emissions Total		234.2	226.4	118.5	292.3	94.9	13.0	3.6

4.4 Excludable Emissions

The baseline actual-to-projected actual emission test allows for the exclusion of emissions that could have been accommodated during the 24-month period used to establish the baseline actual emissions (e.g. demand growth). TRONOX estimated excludable emissions utilizing: (1) the maximum production rate recorded during the period; and (2) the amount of steam produced per ton of product. The Division reviewed the estimated excludable emissions and concurred that these emissions could have been accommodated during the baseline period. Table 4-4 shows the excludable emissions for the project affected emission units.

Table 4-4: Excludable Emissions (tpy)								
Source ID	Source Description	PM	PM ₁₀	PM _{2.5}	NO _x	CO	VOC	H ₂ S
PA-4	Sesqui Hammermill Crusher Vent	0.4	0.4	0.3	--	--	--	--
PA-5	Sesqui Plant Ore Screening Vent	0.3	0.3	0.2	--	--	--	--
PA-6	Sesqui Plant Dissolver Vent	0.2	0.2	0.2	--	--	--	--
PA-7	Sesqui Plant Dissolver Vent	0.2	0.2	0.2	--	--	--	--
PA-8	Sesqui Plant Dissolver Vent	0.2	0.2	0.2	--	--	--	--
PA-9	Sesqui Plant Dissolver Vent	0.2	0.2	0.2	--	--	--	--
RA-1	R-3 Gas-Fired Calciner	0.5	0.5	0.2	0.8	0.1	0.0	--
RA-22A&B	R-9 Gas-Fired Calciner	0.0	0.0	0.0	--	--	--	--
RA-23A&B	R-13 Gas-Fired Calciner	1.0	1.0	0.6	0.5	0.8	0.1	--
RA-24	R-15 Gas-Fired Calciner	2.1	2.1	1.0	2.6	1.1	0.1	--
RA-25	R-5 Sesqui Fluid Bed Calciner	1.3	1.3	0.6	--	--	0.0	--
RA-26	R-6 Sesqui Fluid Bed Calciner	0.9	0.9	0.5	--	--	0.0	--
RA-29	R-2 Sesqui Fluid Bed Calciner	0.6	0.6	0.3	--	--	0.0	--
RA-28	Sesqui Bagging	0.3	0.3	0.3	--	--	--	--

Table 4-4: Excludable Emissions (tpy)								
Source ID	Source Description	PM	PM ₁₀	PM _{2.5}	NO _x	CO	VOC	H ₂ S
RA-33	Sesqui Silo Storage	0.7	0.7	0.4	--	--	--	--
SESQUIPILE	Sesqui Ore Stockpile Activity	1.0	0.3	0.1	0.2	0.1	0.0	--
SESQWE	Sesquie Ore Stockpile Wind Erosion	0.0	0.0	0.0	--	--	--	--
SESQUILOAD	Sesquie Plant Railcar Loading	0.1	0.1	0.0	--	--	--	--
SESQUI-CT	Sesqui Cooling Tower	0.4	0.4	0.0	--	--	--	--
MONO6	Mono 1 Fluid Bed Dryer	1.2	1.2	0.7	--	--	0.0	--
MONO9	Mono Railcar Loadout	0.5	0.5	0.3	--	--	--	--
MONO10	Mono Bulk Truck Loadout	0.9	0.9	0.4	--	--	--	--
MONO12	Mono Loadout Screening	0.8	0.8	0.6	--	--	--	--
NS6	Mono 2 Fluid Bed Dryer	1.3	1.3	0.7	--	--	0.0	--
MONO1CT	Mono 1 Cooling Tower	0.3	0.3	0.0	--	--	--	--
MONO2CT	Mono 2 Cooling Tower	0.5	0.5	0.0	--	--	--	--
MW1	ELDM Lime Silo	0.1	0.1	0.0	--	--	--	--
MW2	ELDM Perlite Precoat Silo	0.0	0.0	0.0	--	--	--	--
MW3	ELDM Fluid Bed Dryer	4.4	4.4	2.5	--	--	0.1	--
MW4	Mine Water Housekeeping	0.4	0.4	0.2	--	--	--	--
MW6	H ₂ S Scrubber/CO ₂ Stripping System	--	--	--	--	--	--	0.5
MW7	LWP H ₂ S Vent	--	--	--	--	--	--	0.0
RD3	Lime Slaker Silo	0.0	0.0	0.0	--	--	--	--
SM1	Lime Kiln	0.0	0.0	0.0	0.0	0.0	0.0	--
PH-1A	#1 Gas-Fired Boiler	0.0	0.0	0.0	1.3	0.4	0.0	--
PH-1B	#2 Gas-Fired Boiler	0.0	0.0	0.0	1.4	0.4	0.0	--
PH-2	#3 Gas-Fired Boiler	0.0	0.0	0.0	0.9	0.3	0.0	--
PH-3	#4 Gas-Fired Boiler	0.0	0.0	0.0	1.8	0.9	0.0	--
MW-5	#8 Gas-Fired Boiler	0.2	0.2	0.2	1.2	1.0	0.1	--
Rail	Switch Engine Activity	0.1	0.1	0.1	5.5	0.5	0.3	--
Projected Actual Emissions Total		20.9	20.2	10.8	16.2	5.6	0.8	0.5

4.5 Applicability Test

To determine PSD applicability the baseline emissions are subtracted from the projected actual emissions, taking into consideration the excludable emissions, to determine the net emissions change. Excludable emissions can either be subtracted from the projected actual emissions or added to the baseline for determination. The difference is then compared with the PSD significant emission rate for each pollutant. Based on projected actual emissions minus baseline emissions (taking into consideration the excludable emissions), the various plant modifications to increase production at the Westvaco Facility are not considered a major modification as there will not be a significant increase of a regulated pollutant under Chapter 6, Section 4. Table 4-5 shows the net emissions change for each regulated pollutant at the Westvaco Facility which is subject to PSD review for this project.

Table 4-5: Significant Emission Rate Increase Determination (tpy)						
Pollutant	Projected Actual Emissions	Demand Growth	Baseline Emissions	Net Emissions Change	PSD Significant Emission Rate	PSD Review Required
PM	234.2	20.9	203.4	9.9	25	NO
PM ₁₀	226.4	20.2	196.6	9.6	15	NO
PM _{2.5}	118.5	10.8	102.3	5.4	10	NO
NO _x	292.3	16.2	238.9	37.2	40	NO
CO	84.9	5.6	63.0	19.3	100	NO
VOC	13.0	0.8	10.9	1.3	40	NO
H ₂ S	3.6	0.5	3.0	0.1	7	NO

4.6 Limits and Monitoring

The Division proposes to set an actual emissions limit for the pollutants used to determine PSD applicability based on the baseline emissions (including excludable emissions) plus the PSD significant emission rate for each pollutant. If the baseline plus PSD significant emission rate is greater than the potential to emit or other permitted limit for the affected units, the Division will default to the potential to emit or other established limits for that pollutant if the PSD significant emission rate is achievable. If it isn't possible to achieve the PSD significant emission rate no actual emission limit will be established for that pollutant. By using this proposed actual emission limit it will clearly define that if these actual emission limits are exceeded, TRONOX will have triggered a major modification under Chapter 6, Section 4 of the WAQSR.

Table 4-6: Proposed Actual Emission Limits ¹			
Pollutant	Baseline Emissions (tpy)	PSD Significant Emission Rate (tpy)	Proposed Actual Emission Limit (tpy)
PM	224.3	25	249.3
PM ₁₀	216.8	15	231.8
PM _{2.5}	113.1	10	123.1
NO _x	255.1	40	295.1
CO	68.6	100	168.6
VOC	11.7	40	51.7
H ₂ S	3.5	7	10.5

¹ Actual emission limits would apply for ten (10) years following resumption of regular operations after the change.

Under Chapter 6, Section 4 of the WAQSR, TRONOX will be required to monitor and keep records of the pollutants listed in Table 4-6 for a period of ten (10) years following resumption of regular operation after the change as the project either increases the design capacity or potential to emit. Emission tracking is required in order to ensure that actual emissions do not exceed the Division's proposed actual emission limit.

5.0 CHAPTER 6, SECTION 2 – BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

TRONOX proposed an outlet grain loading of 0.005 gr/dscf for the Mono Power Fly Ash Silo (NS-10) and Mono Power Fly Ash Truck Loadout (NS-11) baghouses associated with the reactivation of the fly ash handling system. The Division considers the proposed outlet grain loading to be representative of BACT for this type of operation.

None of the other project affected emission units at the Westvaco Facility are being physically modified or are experiencing a change in the method of operation with an increase in potential emission rate. Therefore, a BACT analysis is not required for the other project affected emission units.

6.0 CHAPTER 6, SECTION 3 – MAJOR SOURCE APPLICABILITY

With this modification, TRONOX will need to modify Operating Permit 3-1-132 in accordance with Chapter 6, Section 3 of the WAQSR.

7.0 CHAPTER 5, SECTION 2 – NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The Westvaco Facility is subject to Subparts D, Db, Y and OOO under 40 CFR part 60. The various plant modifications to increase production at the Westvaco Facility do not change the applicability of these subparts.

In addition the proposed Mono Power Fly Ash Silo (NS-10) and Mono Power Fly Ash Truck Loadout (NS-11) baghouses are not subject to any NSPS as currently promulgated by the EPA.

8.0 CHAPTER 5, SECTION 3 – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)

The Westvaco Facility is subject to Subparts AAAAA, DDDDD, and ZZZZ under 40 CFR part 63. The various plant modifications to increase production at the Westvaco Facility do not change the applicability of these subparts.

In addition the proposed Mono Power Fly Ash Silo (NS-10) and Mono Power Fly Ash Truck Loadout (NS-11) baghouses are not subject to any NESHAPs as currently promulgated by the EPA.

9.0 AMBIENT AIR IMPACT

9.1 Criteria Pollutants

Ambient air quality modeling was provided by TRONOX to assess the impacts of the proposed modification. TRONOX modeled each pollutant based upon the net projected increase from the facility's PSD baseline emissions. After the Division reviewed TRONOX's modeling files the Division found that all applicable ambient air standards (NAAQS/WAAQS) will be protected, as no pollutant exceeded their significant impact levels (SILs). Table 9-1 shows the results of this modeling analysis.

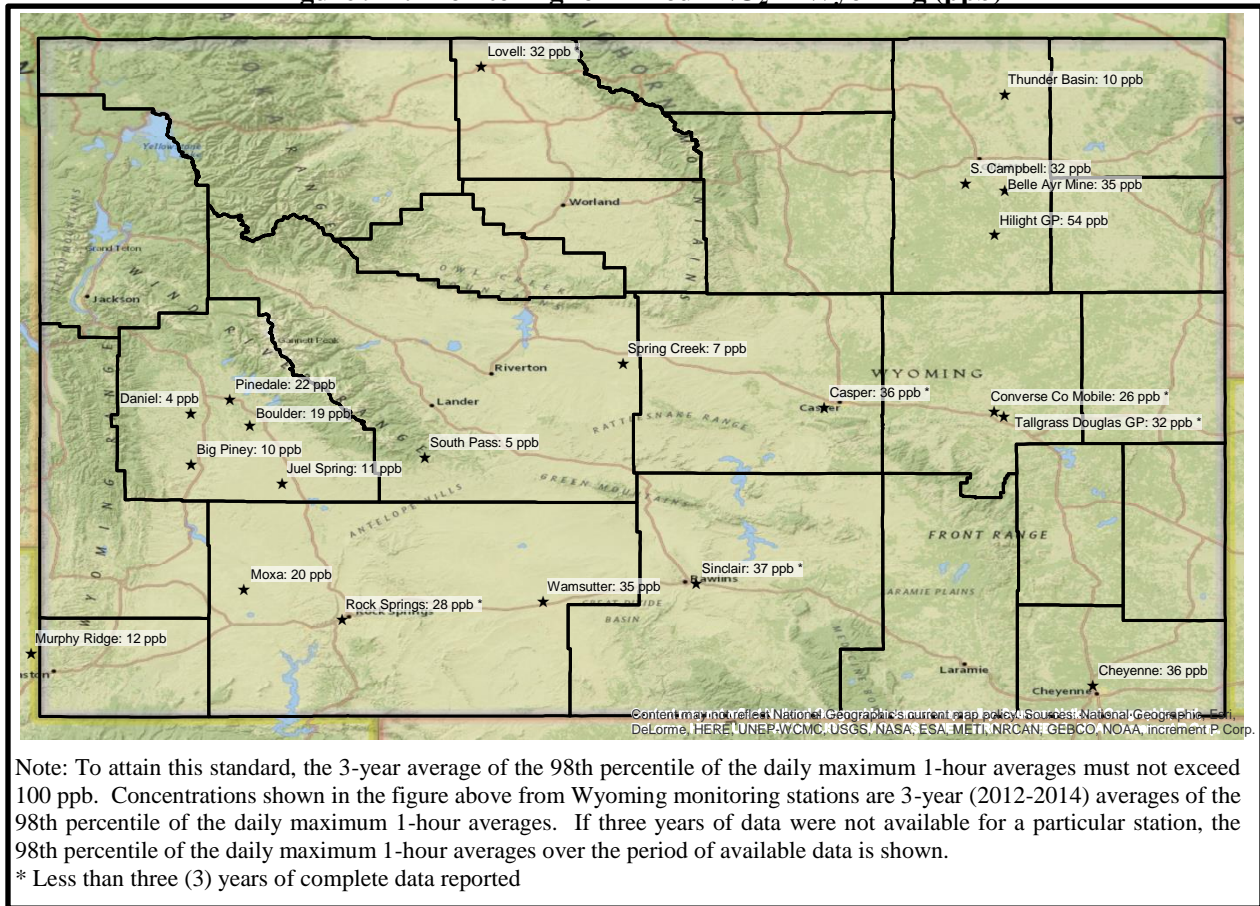
Table 9-1: Ambient Air Quality Modeling Results			
Pollutant	Averaging Period	SIL ($\mu\text{g}/\text{m}^3$)	Modeled Value ($\mu\text{g}/\text{m}^3$)
NO ₂	Annual	1.0	0.37
NO ₂	1-Hour	7.5 ¹	7.51
PM ₁₀	Annual	1.0	0.11
PM ₁₀	24-Hour	5.0	0.58
PM _{2.5}	Annual	0.3	0.06
PM _{2.5}	24-Hour	1.2	0.27
SO ₂	Annual	1.0	<0.01
SO ₂	24-Hour	5.0	0.01
SO ₂	3-Hour	25.0	0.03
SO ₂	1-Hour	7.8 ¹	0.08
CO	8-Hour	500	2.25
CO	1-Hour	2,000	6.60

¹ EPA has yet to propose a SIL for 1-hour NO₂ and SO₂. These values were provided by EPA in general guidance memos dated August 23, 2010 and June 28, 2010.

9.2 1-Hour NO₂

Statewide monitoring of NO₂ on the basis of a 1-hour averaging period indicates that the 1-hour NAAQS of 100 ppb is not threatened at any of twenty-one (21) monitoring sites through 2014 (see Figure 9-1 below). Several of the Wyoming monitors are located in areas of concentrated industrial development. County-wide NO_x emissions in Sweetwater County were an estimated 38,280 tons in 2011. Multiple monitors are also located in Campbell County (estimated 44,420 tons of NO_x in 2011), Converse County (estimated 19,280 tons in 2011) and Sublette County (estimated 4,970 tons NO_x in 2011). Based on the current statewide 1-hour NO₂ monitoring and the change associated with the NO_x emissions total for the Westvaco Facility the Division is satisfied that the operation of the Westvaco Facility will not prevent the attainment or maintenance of the 1-hour NAAQS for NO₂.

Figure 9-1: Monitoring for 1-Hour NO₂ in Wyoming (ppb)



9.3 Ozone

The applicant performed an analysis of potential ozone impacts from the modification of the Westvaco Facility based on potential ozone precursor emissions of NO_x and VOC from the net projected increases. These emissions are compared to regional NO_x and VOC emissions in the context of monitored regional background ozone concentrations. Table 9-2 summarizes potential NO_x and VOC emissions increases from the Westvaco Facility along with regional emissions from Sweetwater County, and the percentage of emissions from the Westvaco Facility compared to regional emissions. The emissions inventory is from data year 2011 and represents the most recent inventory available for the county directly affected by this facility.

Table 9-2: County-Wide Total Emissions and Percentage from Project		
Facility	NO_x Sources (tpy)	VOC Sources (tpy)
Change in Westvaco Facility Emissions from Baseline	37.7	1.5
County-Wide Emissions (2011)		
Sweetwater County	37,799	35,592
% of County-Wide Total from Project	0.1	0.004

As noted in the table, potential NO_x and VOC emissions from the Westvaco Facility, as precursors for ozone formation, represents an increase of 0.1% or less for each precursor. To further evaluate whether these increases will significantly impact monitored ozone concentrations in the region surrounding the Westvaco Facility, the applicant obtained a summary of monitored ozone concentrations from the Moxa, Hiawatha and Wamsutter O₃ monitors in Sweetwater County for calendar years 2012-2014. Table 9-3 summarizes the three-year average of the data.

Table 9-3: Fourth-Highest 8-hour Average Ozone Concentrations (2012-2014, ppb)		
Site	Average	Ozone Standard¹ (ppb)
Moxa	65	75
Hiawatha	63	
Wamsutter	62	
Average	63	

¹ The form of the ozone standard is the 3-year average of the annual 4th-highest daily maximum 8-hour concentrations.

The total potential increase to the NO_x and VOC emissions from the Westvaco Facility are approximately 39.2 tpy. When added to the total NO_x and VOC emissions from the Sweetwater County area (73,391 tpy), based on the emissions inventory, this represents approximately a 0.05% increase of precursor emissions. The proposed increase in precursor emissions, along with the measured ozone values in Sweetwater County, indicate that the proposed project would not prevent the attainment or maintenance of the WAAQS/NAAQS for ozone.

10.0 PROPOSED PERMIT CONDITIONS

The Division proposes to issue an Air Quality Permit for TRONOX Alkali Wyoming Corporation to modify the Westvaco Facility with the following conditions:

1. That authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution and for determining compliance or non-compliance with any rules, standards, permits or orders.

2. That all substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.
3. That TRONOX Alkali Wyoming Corporation shall file a complete application to modify their Operating Permit within twelve (12) months of commencing operation, in accordance with Chapter 6, Section 3(c)(i)(B) of the WAQSR. Where an existing operating permit would prohibit such construction or change in operation, the owner or operator must obtain a permit revision before commencing operation.
4. That all notifications, reports and correspondence associated with this authorization shall be submitted to the Stationary Source Compliance Program Manager, Air Quality Division, 122 West 25th Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 510 Meadowview Drive, Lander, WY 82520. Submissions may also be done electronically through <https://airimpact.wyo.gov> to satisfy requirements of this permit.
5. That written notification of the anticipated date of initial startup, in accordance with Chapter 6, Section 2(i) of the WAQSR, is required not more than sixty (60) days or less than thirty (30) days prior to such date. Notification of the actual date of startup is required within fifteen (15) days after startup.
6. That the date of commencement of construction shall be reported to the Administrator within thirty (30) days of commencement. In accordance with Chapter 6, Section 2(h) of the WAQSR, approval to construct or modify shall become invalid if construction is not commenced within twenty-four (24) months after receipt of such approval or if construction is discontinued for a period of twenty-four (24) months or more. The Administrator may extend the period based on satisfactory justification of the requested extension.
7. That performance tests be conducted, in accordance with Chapter 6, Section 2(j) of the WAQSR, within thirty (30) days of achieving a maximum design rate but not later than ninety (90) days following initial startup, and a written report of the results be submitted. The operator shall provide fifteen (15) days prior notice of the test date. If a maximum design rate is not achieved within ninety (90) days of startup, the Administrator may require testing be done at the rate achieved and again when a maximum rate is achieved.

8. That TRONOX Alkali Wyoming Corporation shall track actual emissions from the sources listed in (a) of this condition to demonstrate the proposed project does not result in a major modification under Chapter 6, Section 4 of the WAQSR.

- a. Source affected by the project is as follows:

Source ID	Source Description	Source ID	Source Description
PA-4	Sesqui Hammermill Crusher Vent	MONO10	Mono Bulk Truck Loadout
PA-5	Sesqui Plant Ore Screening Vent	MONO12	Mono Loadout Screening
PA-6	Sesqui Plant Dissolver Vent	NS6	Mono 2 Fluid Bed Dryer
PA-7	Sesqui Plant Dissolver Vent	MONO1CT	Mono 1 Cooling Tower
PA-8	Sesqui Plant Dissolver Vent	MONO2CT	Mono 2 Cooling Tower
PA-9	Sesqui Plant Dissolver Vent	MW1	ELDM Lime Silo
RA-1	R-3 Gas-Fired Calciner	MW2	ELDM Perlite Precoat Silo
RA-22A&B	R-9 Gas-Fired Calciner	MW3	ELDM Fluid Bed Dryer
RA-23A&B	R-13 Gas-Fired Calciner	MW4	Mine Water Housekeeping
RA-24	R-15 Gas-Fired Calciner	MW6	H ₂ S Scrubber/CO ₂ Stripping System
RA-25	R-5 Sesqui Fluid Bed Calciner	MW7	LWP H ₂ S Vent
RA-26	R-6 Sesqui Fluid Bed Calciner	RD3	Lime Slaker Silo
RA-29	R-2 Sesqui Fluid Bed Calciner	SM1	Lime Kiln
RA-28	Sesqui Bagging	PH-1A	#1 Gas-Fired Boiler
RA-33	Sesqui Silo Storage	PH-1B	#2 Gas-Fired Boiler
SESQUIPILE	Sesqui Ore Stockpile Activity	PH-2	#3 Gas-Fired Boiler
SESQWE	Sesque Ore Stockpile Wind Erosion	PH-3	#4 Gas-Fired Boiler
SESQUILOAD	Sesque Plant Railcar Loading	MW-5	#8 Gas-Fired Boiler
SESQUI-CT	Sesqui Cooling Tower	Rail	Switch Engine Activity
MONO6	Mono 1 Fluid Bed Dryer	NS-10	Mono Power Fly Ash Silo
MONO9	Mono Railcar Loadout	NS-11	Mono Power Fly Ash Truck Loading

- b. That the sum of the actual emissions, on a calendar year basis, from the sources listed in (a) shall not exceed the following emission levels:

Pollutant	Tons Per Year
PM	249.3
PM ₁₀	231.8
PM _{2.5}	123.1
NO _x	295.1
CO	168.6
VOC	51.7
H ₂ S	10.5

- c. That actual emissions from the sources in (a) shall be determined using the following methodologies in decreasing order of preference, unless an alternate method is approved by the Division: continuous emission monitoring systems (if available), stack test data (if available), AP-42 emission factors (if available), and engineering estimates.

- d. That all emissions limits set forth in valid air quality permits for the sources listed in (a) shall remain in effect.
 - e. That TRONOX Alkali Wyoming Corporation shall produce, at minimum, 736,940 Klbs of steam from the gas-fired boilers in (a) of this condition.
 - f. That TRONOX Alkali Wyoming Corporation shall monitor emissions and steam production in accordance with the requirements of this condition and shall calculate and maintain a record of the annual emissions in tons per year and total steam production from the gas-fired boilers, on a calendar year basis for a period of ten (10) years following resumption of regular operations after the change. For purpose of this permit, the ten (10) year period will start the following calendar year after the notification of startup, required by Condition 5 of this permit, is submitted to the Division.
 - g. That TRONOX Alkali Wyoming Corporation shall submit a report to the Division, within 60 days after the end of each year, the annual emissions for each source listed in (a), the annual totals for each pollutant listed in (b), and the total steam production for the gas-fired boilers in (a).
 - h. That upon completion of the ten (10) year monitoring period set forth in (e), the requirements of Condition 8 shall expire.
9. That all records as required by this permit shall be maintained for a period of at least five years from the date such records are generated and the records shall be made available to the Division upon request.
10. Performance testing, as required by Condition 7 of this permit, shall be conducted on the following sources:
- i. Mono Power Fly Ash Silo and Mono Power Fly Ash Truck Loadout Baghouses:

PM₁₀ Emission: Testing shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 5.
- A test protocol shall be submitted for review and approval prior to testing. Results shall be submitted to the Division within forty-five (45) days of completing the tests.
11. That particulate emissions (PM₁₀) from the following sources shall be limited to the following:

Source ID	Description	gr/dscf	lb/hr	tpy
NS-10	Mono Power Fly Ash Silo	0.005	0.1	0.3
NS-11	Mono Power Fly Ash Truck Loadout	0.005	0.1	0.3

12. That the following requirements shall be met for the Mono Power Fly Ash Silo and Mono Power Fly Ash Truck Loadout baghouses:
 - a. TRONOX Alkali Wyoming Corporation shall, on a daily basis, check for the presence of any visual emissions at each of the baghouses on any day that the baghouses are operating. The visual observation shall be conducted at each baghouse by personnel who are educated on the general procedures for determining the presence of visible emissions but not necessarily certified to perform Method 9 observations. Observation of any visible emissions from any of these units shall prompt immediate inspection and, if necessary, corrective action.
 - b. That the opacity for the baghouses shall be limited to less than twenty (20) percent as determined by Method 9 of appendix A, 40 CFR part 60.
 - c. That the baghouses shall be tested every five (5) years following the permit issuance date. Testing shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 5. A test protocol shall be submitted for review and approval prior to testing and notification of the test date shall be provided to the Division at least fifteen (15) days prior to the test date. Test results shall be submitted to the Division within forty-five (45) days after the completion of the test.